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ABSTRACT

Women continue to be underrepresented in scientific and business careers, yet little is known about the impact of women's school experiences on their career development. To investigate how educational institutions encourage and discourage women entering scientific and business careers, 50 female college seniors in these majors were interviewed and asked to complete a 26-item career survey, taken from the Student Development Task Inventory (Winston 1979), and a questionnaire on influences. Mean scores and a stepwise regression analysis indicated that subjects received encouragement in their educational and career goals from parents, friends, siblings, and certain faculty members. Classroom experiences, doing well academically, and special projects were indicated as encouragers, while extra curricular activities other than work experiences were not considered influential. These women rated interactions with counselors as their least encouraging experience. Interactions with graduate students and advisors were also viewed as less encouraging. Subjects most active in career planning indicated that they were encouraged by professional conferences, and cited a need for more female role models and improved career advising. (The paper includes the survey instruments.) (JAC)

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Educational Factors that Encourage Women to Pursue Pioneer Careers

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of the American Psychological Association
at Anaheim, California
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Abstract

Educational Factors that Encourage Women to Pursue Pioneer Careers

The present study was designed to investigate how educational institutions encourage and discourage women to enter scientific and business careers. Fifty female seniors in these majors were interviewed and asked to complete a Career Survey derived from the Student Developmental Task Inventory and a Questionnaire on Influences. Mean scores and a stepwise regression analysis were employed. Results indicated encouraging factors were classroom experiences and a broad supportive network. Less encouraging were interactions with counselors, graduate students, advisors and classes in Mathematics and with laboratories. Subjects most active in career planning were encouraged by professional conferences. A need for more female role models and improved career advising was cited.

Educational Factors that Encourage Women to Pursue Pioneer Careers

Women continue to be underrepresented in scientific and business careers. The question addressed by this study is how educational institutions encourage and discourage women to enter these fields.

Osipow (1975) described women with a "Pioneer career pattern". Pioneer women are engaged in significant out-of-home employment on a regular basis, often in a male dominated field and in competition with males, exhibit a clear commitment to their profession and advance in it. Seligman (1980) notes that several studies have shown that certain personality variables, attitudes towards feminist issues and family relationships are correlated with the choice of a Pioneer career pattern.

However, little is known about the ways in which womens' experiences in school have an impact on their career development. Studies show that women in college are more likely than men to lower their educational aspirations (Fenske and Scott, 1973). They are more likely to leave majors that are traditionally sought by men (Baird, 1976). Longitudinal studies from Project TALENT indicate that most women's career patterns are not stabilized until they have graduated college (Patterson, 1973). One study on female students in a non-traditional major, pre-veterinary medicine, found that the women had been discouraged in high school and half had been discouraged in college (Andberg, 1978). O'Donnell and Anderson (1978) suggest that such variables as role-modeling influences, work experiences and faculty-student interaction deserve more scrutiny.

Thus it appears that the patterns for career development in women are well defined, but the influence factors are under researched. The objective of this study is three-fold: to identify the experiences and relationships in education which have assisted women majoring in scientific and business fields, to determine what factors have impacted those non-traditional women who are most active in their career pursuit and to elicit suggestions on what changes in the educational environment would be most beneficial.

This research was supported by a grant from the Women's Resource Center, University of Denver.

The author would like to acknowledge Carla Ballon, Grace Couchman and Sandy Deutsch for their suggestions and assistance in data collection and John McNeill for his statistical consultation.

Method

Subjects

The subjects in the present study were 50 female seniors within three months of graduating with a bachelors degree at a private university. Twenty-five were bachelor of science candidates in natural or behavioral sciences. Twenty-five were business majors in accounting and finance, marketing or hotel and restaurant management. All intended to pursue a career related to their major.

Instruments

A behavioral measure of the extent to which the subjects had been actively involved in their career planning was determined by using a Career Planning Survey. The CPS consisted of twenty-six items taken from the career development and life style sub-scales of the Student Development Task Inventory (Winston, 1979). Items on the CPS include such specific questions as, "I am acquainted with at least three persons who are actively involved in the kind of work I visualize for myself in the future." In addition to these questions, subjects were asked to describe their career goals, their immediate plans. and their family and life style preferences.

A thirty minute structured interview format was developed and administered to assist subjects in recalling signigicant influences in their career choice. Each subject was asked to recall and describe for their pre-college experience and each year in college, their career interests at that time, influences of peers, teachers, family, others and relevant experiences in the classroom, in extra-curricular activities, in work and other activities.

A Questionnaire on Influences, QI, was developed to measure the degree to which particular persons or experiences encouraged or discouraged the subjects in pursuing their career goals. The Questionnaire contained forty-two items on a seven point Likert format. Items were derived from a review of research and ten pilot interviews with female students with non-traditional majors in their junior year. Items were grouped as follows: high school experiences, college courses, faculty

and other professionals, work/intern experience, peers, extra-curricular activities, career planning activities, awards and special recognition and family. Subjects were asked to rate the degree to which each item encouraged them in their career development. Encouragement was described broadly as helping one to gain confidence, to clarify goals, to further develop interests or to emulate a person, etc.

Finally, each subject was asked to write a response to the question, "What changes in the university environment would you recommend that would help women undergraduates in their career decisions and plans?"

Procedure

A letter explaining the research project was sent to all female seniors in sciences and to a strafified random sample of female business seniors. Subjects were offered $5.00 for their participation. Ninety-three percent of the science majors and 86% of the business majors agreed to be interviewed. The investigator and four students meet individually with each subject to administer the instruments and to conduct a taped interview. The interviewers were female, one graduate student and three undergraduate students, all who had at least a year of counseling training and who were trained to conduct the research project during the pilot interviews.

Analysis

The data were first analysed by comparing the scores of the seniors in sciences and the seniors in business. Since two groups did not differ statistically on their scores on the Career Planning Survey, the Questionnaire on Influences and the frequency of types of suggestions, the data was analysed as a total.

Mean scores of the items on the Questionnaire on Influences were tabulated to determine the subjects' most and least encouraging experiences.

Then a stepwise regression analysis was made to determine the most salient experiences of those students who had progressed most in their career planning, had the highest scores on the Career Planning Survey.

Finally, frequencies of suggestions for improving the university environment were tabulated.

Results and Discussion

Most and least encouragers

Table 1 shows the items ranked most and least encouraging. On a seven point scale, ten items received a mean score of 5.5 or higher and seven items received a mean score less than 5. For this analysis, five new variables were combined when there were not any statistical differences between related items, i.e., father and mother, female and male friend, students in my major and students with whom I studied, classes that had lab work or stressed math and discussions with advisor and academic advisor.

Insert Table 1 about here

Women intending to pursue Pioneer careers who complete their college majors report a number of encouragers. The subjects indicated they received support from a broad range of people, parents, friends of both sexes, professionals, siblings, classmates and certain faculty members. Classroom experiences, doing well academically, advanced classes, special projects and papers also were indicated as encouragers. Extra-curricular activities, other than work experiences were not considered to be strong encouragers for the total sample.

Pioneer women rated their interactions with counselors as their least encouraging experience. Interactions with graduate students and advisors also are viewed as less encouraging. Moore and Veres (1979) found that female career innovators in a two year college were less likely to seek help from advisors no matter what problems they were having. While these findings may be in part due to the reluctance of Pioneer women to seek assistance, further investigation into past experiences is warranted. It seems likely that counselors and advisors are hesitant to encourage women in non-traditional careers. It also may be that these individuals are not seen as good role models since the most frequent recommendation was to provide more female role models.

Pioneer women also reported that classes stressing lab work or math were less encouraging to them. While overcoming initial deficiencies, if they exist in these areas, may be viewed as an accomplishment, certainly institutions can seek to be of more assistance.

Encouragers of those most active in career planning

Table 2 shows the results of the stepwise regression analysis of the Career Planning Survey and the Questionnaire on Influences to determine what factors were most salient in encouraging those subjects who had progressed furthest in their career development. Five items contributed to 47% of the variance at the .01 level of significance.

Insert Table 2 about here

Attendance at professional conferences and workshops was by far the most relevant encourager. This is another factor that educators can support and encourage. Involvement in student activities appears to be relevant if the subject sees herself as taking leadership. Interestingly, these students perceive greater encouragement from male friends and less from fathers. Perhaps there is an inverse relationship or the subjects are more independent of their fathers. The findings suggest students who are more advanced in their career development likely are more active individuals who take on developmental tasks earlier and who involve themselves in activities that are usually the province of professionals and graduate students.

Suggestions on improving the university environment

Table 3 shows the categories of suggestions and the percentage of the sample that made each suggestion. Eighty percent requested more female role models. Female role models were requested as advisors, professors, departmental chairpersons, professional women and speakers.

Insert Table 3 about here

Better career advising was requested especially for those women who were uncertain of their goals and who wished to be better informed of several career options. The remaining items suggested that women favored the idea of special services and programs to suite their needs. Suggestions ranged from seminars and internships to more information about current programs and services.

In summary, it appears that a number of factors that can be influenced by educational institutions do effect the career development of Pioneer women. Further research on this topic might focus more on the particular qualities of these factors and might incorporate a larger sample, a comparison group of students who were definitely discouraged from Pioneer careers and a longitudinal component.

Table 1

Means and Standard Deviations of Most and Least Encouraging Factors in Pioneer Women's Career Development[a]

Rank	Factor	Mean	SD
	Most encouraging		
1	Parents	5.98	1.01
2	Friends	5.95	.99
3	Advanced classes in major	5.87	1.03
4	Discussions with professionals	5.74	1.21
5	Academic performance	5.64	1.14
6	Sister/brother	5.64	1.22
7	Special projects/papers	5.62	1.34
8	Male professors	5.60	1.24
9	Students in major/studied with[a]	5.59	1.24
10	Discussions with faculty (not advisor)	5.57	1.17
11	Career research I did on my own	5.52	1.03
12	Boyfriend	5.49	1.36
	Least encouraging		
1	High school counselor	4.57	1.58
2	Discussions with counselors on personal or career issues[a]	4.67	1.21
3	High school work experience	4.73	1.10
4	Classes with labs/focused on Math	4.75	1.02
5	Graduate students	4.77	1.39
6	Student groups related to major[a]	4.81	1.29
7	Discussions with academic advisor	4.88	1.34

Note: 7 = very encouraging. 6 = encouraging, 5 = somewhat encouraging, 4 = neither encouraging or discouraging

a: All ns = 50 except items noted = 49

Table 2

Summary of Regression Analysis Predicting Encouragers of Pioneer Women Most Active in Career Planning

Variable	r	R^2	F
Professional conferences or workshops	.45	.20	11.04*
Beginning classes in major	.36	.09	8.86*
Male friends	.35	.07	8.07*
Father	-.11	.06	7.56*
Groups in which I took leadership	.39	.04	7.05*

Note. n = 50 df = 1, 44

*$p < .01$

Table 3

Recommendations on Ways to Foster the Careers of Pioneer Women

Recommendation	Percentage recommending
More female role models	26
Better career advising	26
Special programs and services	24
Better publicity on services	22
No suggestions	20
More information about careers	14
Internships, work experiences	10
Seminars	10

Note. Subjects had the option to make as many recommendations as they wished.

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Survey on the Influence of Personal and Educational Experiences on Your Career Goals

Please rate each of the following items on the extent to which your experience encouraged or discouraged you in pursuing your career goals.

Note that a particular experience can encourage or discourage you in a number of ways. For example

- --a particular experience may encourage you by helping you to gain confidence in yourself
- --or it may help you to clarify your career goal
- --or it may have motivated you by furthering your interest in a field or by acquainting you with a person whom you emulated or

- --you could be discouraged by such experiences as becoming aware of aspects of a career you don't like
- --or you may have questioned the feasibility of living the lifestyle you wished, etc.

Do not be concerned if there are some items that do not apply or if there is an overlap in some items.

Experience	VERY ENCOURAGING	ENCOURAGING	SOMEWHAT ENCOU.	NEITHER OR DOESN'T APPLY	SOMEWHAT DISCOUR.	DISCOURAGING	VERY DISCOURAGING
High school experiences							
1. Courses							
2. Relationship with teacher(s)							
3. Counseling or guidance I received							
4. Extra curricular activities and involvements							
5. Work experience							
College Courses							
6. Beginning classes in my major							
7. Advanced classes in my major							
8. Classes that stressed math							
9. Classes that had lab work							
10. Special project(s) or paper(s) I did							

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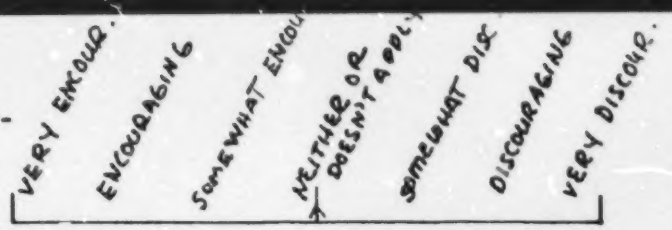


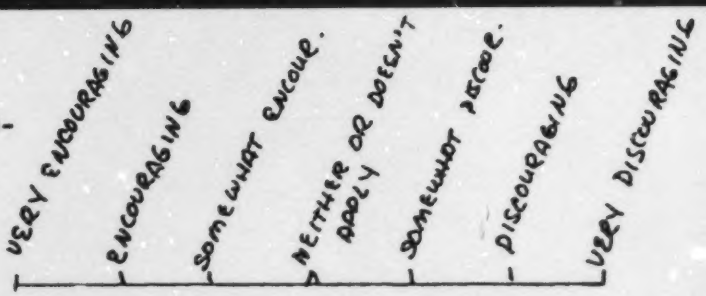
11. Presentation(s) I gave
12. Involvement with Honors (if applicable)
13. Professional conferences, workshops I attended
14. Course(s) other than those in my major
15. My academic performance in my major
16. Special academic assistance I received (if applicable)
17. Other (specify)_____

Faculty/other professionals

18. Male professor(s) in my major
19. Female professor(s) in my major
20. My academic advisor
21. Faculty member(s) not in my academic department
22. Graduate student(s)
23. Other university personal specify if administrator, counselor, etc. _____
24. Other professionals on or off campus. specify _____
25. Other (specify) _____

Work/intern experience during college

26. Work experience related to my major/career interests
27. Work experience as a teaching,lab or research assistant
28. Work experience not directly related to my major/career interests
29. Other _____



Relationships to peers

30. Female friend(s)
31. Male friend(s)
32. Boyfriend(s)
33. Those students with whom I'm acquainted who are in my major
34. Students with whom I studied regularly or occasionally

Extracurricular activities (on or off campus)

35. Activities or groups related to my major (example: premed society, women in management)
36. Activities or groups which I took some leadership responsibilities specify _____
37. Involvement in a special interest or hobby. specify _____
38. Other (specify) _____

Career planning activities

39. Discussions with my faculty/academic advisor
40. Discussions with other faculty member(s)
41. Career research I did on my own
42. Discussions with professional(s) in my career interest
43. Discussions with counselors on personal or career issues

Awards and special recognition

44. Awards that were financial
45. Awards for special recognition specify _____

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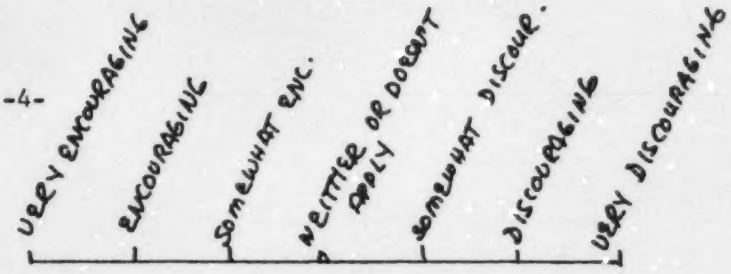

Family influence

46. Mother

47. Father

48. Brother or Sister
specify _____

49. Other relative
specify _____

50. Friend of the family or other
friends. specify _____

51. What changes in the university environment would you recommend that would help women undergraduates in their career decisions and plans?

Career Survey

I. Career Planning

Directions

Please respond to each statement honestly. Read each statement and decide whether the statement is TRUE (usually true) of you, or FALSE (usually false) of you. Consider each statement carefully, but do not spend a great deal of time deliberating on any single statement. Some statements contain phrases such as "I can list," "I know," and "I have identified." When these occur take a moment to actually list or name them in your mind before making your response.

Please circle T or F.

1. Within the past month I have visualized, from time to time, what it would be like to be employed in a particular occupation. T F

2. I have prepared my employment placement credentials and resume or graduate school applications. T F

3. I am a member of at least one club or organization that is specificaliy related to my chosen occupational field. T F

4. I can state clearly my plan for achieving the goals I have established for the next ten years. T F

5. Within the past three months I have read at least one non-required publication related to my major field of study. T F

6. I have identified several occupations in which I could be successful. T F

7. I have formulated a clear plan for getting a job. T F

8. I know at least five requirements necessary for the occupations I am thinking about entering. T F

9. I have sought out leisure time activities for the purpose of helping me obtain an indication of my career interests. T F

10. I have decided whether or not I will seek admission to a graduate or professional school. T F

11. I know where to find out what the prospects for employment are in any occupational field. T F

12. I am getting practical experience while in college through part-time work, or summer job, or internship, or similar employment related to my educational goals. T F

13. I have clearly decided upon the place of marriage, children, and a career in my future. T F

14. I have a mature working relationship with at least one member of the academic community (faculty member, student affairs staff member, administrator). T F

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15. Within the last month I have read an article or book that deals with some aspect of a career I am considering or have decided upon. T F

16. I can name at least two beginning-level work positions which would be open to me in business, industry, government, or education when I graduate. T F

17. I know what I will be doing a year from now. T F

18. I have acceptable alternatives to my present occupational plans in mind. T F

19. I am acquainted with at least three persons who are actively involved in the kind of work I visualize for myself in the future. T F

20. I have asked relatives, faculty members, or other persons to describe kinds of positions available in the fields in which they are working. T F

21. I have made no definite plans as to what I will be doing after college. T F

22. Within the past three months I have had a serious discussion with a faculty member concerning something of importance to me. T F

23. I have recently examined the current labor market demand for people with a degree in the career area(s) I am considering. T F

24. I have listed a number of my specific personal abilities and limitations which I can use as guidelines for narrowing the number of career areas I wish to explore. T F

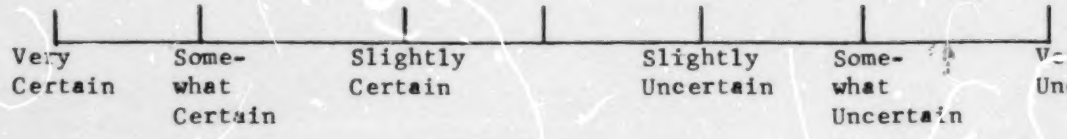
25. I am currently involved in one or more activities which I have identified as being of help in determining what I will do with the rest of my life. T F

26. I have identified at least three people, other than my family, whom I am confident will be influential in my post-college future. T F

II. Career Decision

1. What is your present career goal? Please be as specific as possible.

2. How certain are you of your career goal?



3. What are your immediate plans for the year after you earn your bachelor's degree? Please be as specific as possible.

4. What are your preferences for further education?

___ I have been accepted by a graduate school or a professional school

___ I have applied to one or more graduate or professional schools

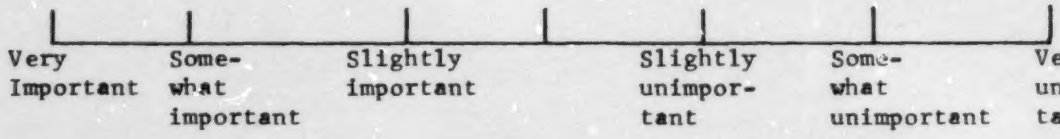
___ I anticipate applying within a year

___ I may apply to school within five years

___ I presently have no plans to attend graduate school

___ Other(explain)

5. How important is your career goal to you?



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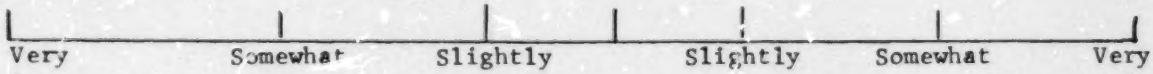
III. Career Values

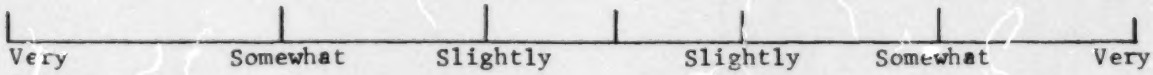
To what extent are the following aspects important to your career goals?

1. To work in a congenial atmosphere

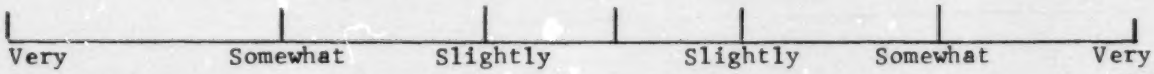
2. To be recognized for the quality of my work in some financial or public way



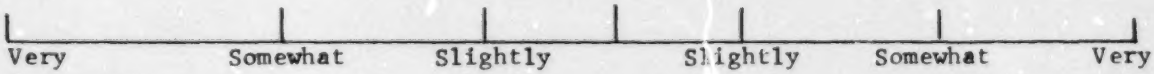
3. To contribute significantly to my field of interest



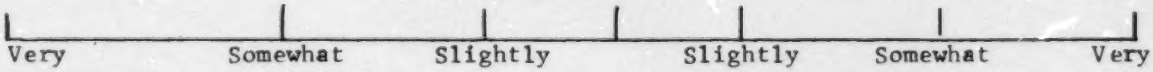
4. To be able to use and improve my skills



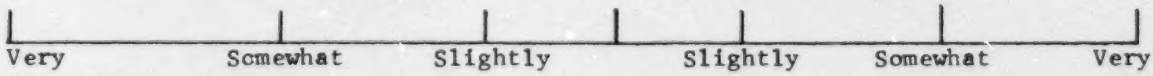
5. To have an opportunity to advance in my career



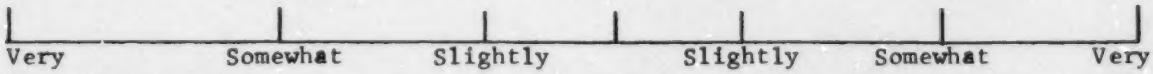
6. To have time to devote to my family and friends



7. To obtain a professional or managerial position

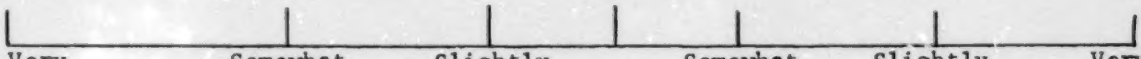


8. To engage in activities I enjoy



9. To be an acknowledged expert in a given field

10. To have work responsibilities which change and have variety



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IV. Family Plans

1. Please describe your plans and preferences in regard to marriage and children.

2. Given a situation in which you had the responsibility of raising children, would you choose to

a. ___ Work full time outside the home
b. ___ Work part time when children are young, then work full time.
c. ___ not work when children are young, then work full time
d. ___ not work when children are young, then work part time
e. ___ not work at all outside the home

3. Given a situation in which you had the responsibility of raising children, how old do you think your youngest child would be if you decided to be employed outside the home?

a. ___ less than a year old
b. ___ between 1 year and 3 years old
c. ___ between 4 and 6 years old
d. ___ between 6 and 12 years old
e. ___ over 12 years old
f. ___ not applicable since I would not choose to work outside the home

4. Consider a hypothetical situation. You are married and your spouse has a job which he likes. You are unemployed, and have an opportunity to go to another area for a professional position. How would you anticipate this situation would be resolved?

Interview Questions

The purpose of this interview is to help you remember some of the experiences and people who had an influence on your career thoughts. After some general questions, I'll ask you to recall what you can about the last few years. I'd like to record this so I don't have to take notes.

General

1. Please describe your current career goals. What is your major? What did you start majoring in as a freshman?

2. When do you remember first thinking that you'd like to be a _____? When did you feel more definite?

3. What did your parents and family think of your career plans? In what ways, directly or indirectly, did they encourage or discourage you? What were their expectations of you? (Request specifics on what was said.)

High School

1. What can you remember about high school that may have encouraged you in your interests? What kind of student were you?

2. What can you remember about teachers or counselors that influenced you? Anyone you admired? Anyone who took personal interest in you? Anyone who gave you positive or negative feedback?

3. Any experiences in your courses or extracurricular activities that made you think about your goals?

4. Any special projects or awards that were important?

College

I'd like to spend a few minutes asking you about each year in college and recalling what were some of the more important events for you. What had an effect on the way you saw yourself and thought about your goals.

1. Starting with your (freshman) year, was it at D.U.? What was it like for you? How would you characterize it?

2. How were your classes? Any experiences or projects you remember? How did you do academically? Were you encouraged or discouraged?

3. What can you remember about your teachers? What kind of relationships did you have with your advisor and other faculty? Would you characterize any as role models for you? Did any show special interest in your or were any particularly helpful?

4. What did you think of the students in your classes and in your major? Was there a cooperative or competitive spirit? Were your female friends majoring in the same field as you? What were their attitudes towards your major and career plans? What about male friends?

5. What activities, if any, were you involved in outside your classwork? In what ways did these influence the way you saw yourself or your career?

6. Can you recall any work experiences you had that year or during the summer? Were they related to your major? How did they effect your thoughts about careers?

In summary

7. How clear or certain were you about your major and career plans at the end of your (freshman) year? Did it change that year? What doubts or conflicts did you have?

8. What persons served as supporters, models or inspiration to you?

9. What experiences would you say were the most encouraging or discouraging for you?

10. How would you describe the experience of being a female in _____ major? Did others treat or relate to you in a different manner from the male students? What were the pros and cons?